

Collembola (Insecta) from Is. Chin-do, Korea

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ABSTRACT

Six species of Collembola are collected from Is. Chin-do. They are *Crossodonthina koreana* Yosii and Lee, 1963, *Homidia minuta* n. sp., *H. munda munda* Yosii, 1956, *H. mediaseta* Lee and Lee, 1981, *H. vigintiseta* Lee and Park, 1984, and *Lepidocyrtus koreanus* n. s.p.

Key words: Systematics, Collembola, Insecta, Chin-do Island, Korea

INTRODUCTION

Chindo Island is located in the south-western tip of the Korean peninsula and lies between 125° 37' -126° 23' E and 34° 07' -34° 34' N with an area of 426.90 km², ranking third in magnitude of islands in Korea. It is predominantly alpine by having peaks of Mt. Ch'omch'al-san (485 m), Mt. Yogui-san (457 m), Mt. Toksin-san (395 m) and so on. It has typical marine climate with an average annual temperature being 14. 3°C and precipitation 1,380 mm approximately.

There has been no intensive survey of insects from the island so far. Some fragmentary reports are on record for insects from some neighboring islands (Kim, 1984; Nam, 1984), those of Wando Is. (Kim and Chang, 1982), and from some isles in Sinan-gun County (Kim and Lee, 1980). They have been limited to pterygote insects, however, and only recently, as far as apterygote insects are concerned, simply one new species of Collembola has been recorded from the Chindo Is. by the present writers (Lee and Kim, 1994).

The present study was carried out as a part of the survey performed during July 22-26, 1994, by the Korean Society of Systematic Zoology in commemoration of its tenth anniversary since the creation in 1984.

MATERIALS AND METHODS

We were able to collect some Collembolan species by portable Berlese's funnels and using aspirators and brush pen in the collecting site. Also we took some soil samples from collecting sites, then transferred to the laboratory and put in Berlese's funnels for 72 hours for extracting specimens. The insects thus obtained were fixed in 80% alcohol solution, then depigmented in Marc Andre I solution and mounted in Marc Andre II for preparing permanent slides.

RESULT

Six species in three genera of two families of Collembola are examined from Chin-do Island as follows, which were found to include two species new to science: *Crossodonthina koreana* Yosii and Lee, 1963, *Homidia minuta*, n. sp., *H. munda munda* Yosii, 1956, *H. mediaseta* Lee and Lee, 1981, *H. vigintiseta* Lee and Park, 1984 and *Lepidocyrtus koreanus*, n. sp. They are members of Entomobryidae except the first one which is Neanuridae. No noticeable variations were observed from those of the same species from the inland so far on record.

DESCRIPTION

Neanuridae

Crossodonthina koreana Yosii and Lee, C.E., 1963 고려흑무늬톡토기

Crossodonthina koreana Yosii and Lee, 1963, p. 1, fig. 1; Lee, 1981, p. 19.

Crossodonthina delamarei Lee, 1973, p. 439, figs. 1-3

Material examined. 4 ♂♂, 2 ♀♀, Chollanam-do Province, Chindo-gun County, Temple Ssanggae-sa, collected from litter. Coll. no. 94-7-1, 23 July 1994.

Remarks. Our specimens agreed well with the description by Yosii and Lee (1963) of Korean materials.

Distribution. Korea and Japan

Entomobryidae

Homidia minuta Kim and Lee, n. sp. 귀염털보톡토기 (신칭)

Body length up to 1.8 mm. Ground color light yellow in alive and white in alcohol, with 1 black spot on vertex and somewhat dark patches in the middle of abdomen (Fig. 1A). Antenna longer than half the length of body, about 4 times head length. Antenna deeply pigmented in III and IV segments, and antenna IV segment with an bilobed apical bulb. Antenna segments ratio as I:II:III:IV = 23:40:37:61. Ocelli 8+8, G and H very small, with eye patch (Fig. 1C). Labral setae 4/5, 5, 4. Seta a_2 shorter than a_1 , but longer than b_2 (Fig. 1D). Labral margin with 2 small papillae. Chaetotaxy of head as: antennal 3, ocular 3, sutural macrosetae 5 and with 1 postocular trichobothrium (Fig. 1C). Head and

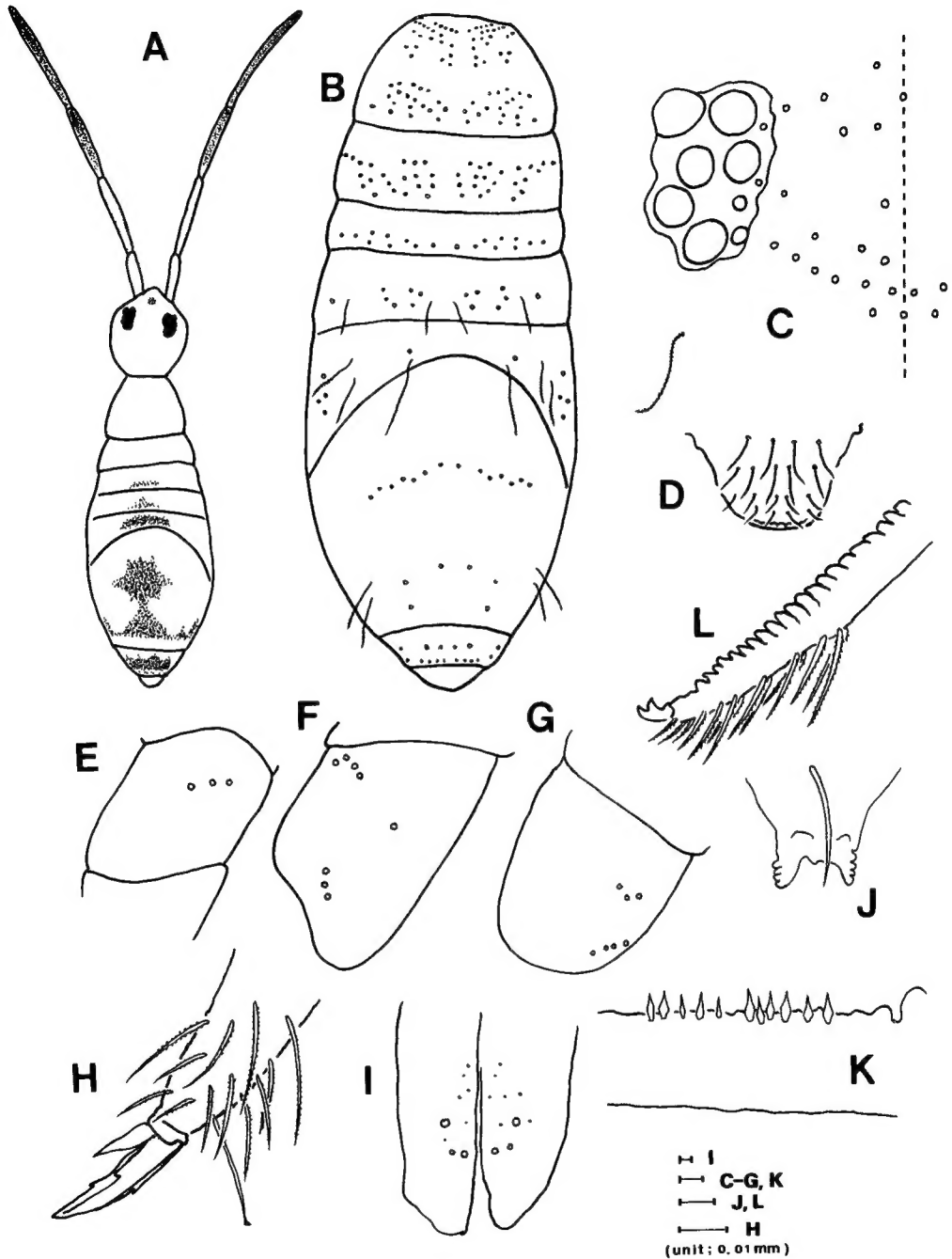


Fig. 1. *Homidia minuta* Kim and Lee, n. sp.: A, habitus; B, chaetotaxy of thoracic and abdominal tergites; C, ocelli and frontal setae; D, labrum; E-G, macrosetae of precoxae, midcoxae and hindcoxae; H, hindclaw; I, ventral tube; J, tenaculum; K, dental spines; L, mucro and posterior of dens.

thorax with numerous macrosetae on the dorsal side. Legs paler, macrochaetal formula of coxae 3/4+1, 3/4+2 (Fig. 1E-G), trochanteral organ with 20 setae. Claw with one clubbed tenent hair (Fig. 1H). Unguis with 1 pair of lateral teeth, 2 inner teeth (Fig. 1H). Unguiculus simple and smooth,

without any tooth (Fig. 1H). Anterior face of ventral tube with 3+3 macrosetae, external 2 in oblique positions as to median furrow and posterior side with numerous simple setae (Fig. 1I). Tenaculum with 4+4 teeth and 1 median seta (Fig. 1J). Furca ratio as manubrium : dens + mucron = 44:54. Dens with 2 rows of setae on the dorsal side and crenulated at the basal side, with 20-25 spines, an average of 23 (Fig. 1K) in number. Mucron bidentated (Fig. 1L).

Type data. Holotype. ♂ Chollanam-do Province, Chindo-gun County, Temple Ssanggae-sa, collected from litter layer. Coll. no. 94-7-1, 25 July 1994. Paratypes. 8 ♂ ♀, same data as holotype.

Remarks. This species is close to *H. heugsanica* Lee and Park, 1984 from Heugsando Island. But they are differentiated by color band pattern of body and chaetotaxy.

Homidia munda munda Yosii, 1956 세모뿔톡토기

Homidia munda Yosii, 1956, p. 70, Taf. XXXVI, figs. 217-219, Taf. XL, figs. 229-230; Lee and Lee, 1981, p. 5.

Homidia munda munda: Lee and Park, 1991, p. 266.

Material examined. 3 ♂ ♀, Chollanam-do Province, Chindo-gun County, Temple Ssanggae-sa, collected from litter. Coll. no. 94-7-1, 23 July 1994,

Remarks. Our specimens agreed well with the original description by Yosii (1956), also coincide with Lee and Lee (1981).

Distribution. Korea and Japan

Homidia mediaseta Lee and Lee, 1981 줄무늬뿔톡토기

Homidia mediaseta Lee and Lee, 1981, p. 4, fig. 1.

Material examined. 4 ♂ ♀, Chollanam-do Province, Chindo-gun County, Temple Ssanggae-sa, collected from litter. Coll. no. 94-7-1, 23 July 1994,

Remarks. Our specimens agreed well with the description by Lee and Lee (1981).

Distribution. Korea

Homidia vigintisetata Lee and Park, 1984 스무털보톡토기

Homidia vigintisetata Lee and Park, 1984, p. 182, fig. 3.

Material examined. 3 ♂ ♀, Chollanam-do Province, Chindo-gun County, Temple Ssanggae-sa, collected from litter. Coll. no. 94-7-1, 23 July 1994,

Remarks. Our specimens agreed well with the description by Lee and Park (1984).

Distribution. Korea

Lepidocyrtus koreanus Kim and Lee, n. sp. 고려작은반딧톡토기 (신칭)

Body length up to 1.4 mm. Dorsal side dark bluish and covered with scales. Antenna bluish, deeper distally (Fig. 2A). Ventral side and legs paler, but coxa and trochanter with bluish color. Antenna unscaled, with numerous simple setae. Antenna IV segment without apical bulb. Antenna : head ratio as 29:25, antenna segment ratio as I:II:III:IV = 3:7:7:12. Ocelli 8+8, with eye patch (Fig. 2C). Labral setae 4/5, 5, 4, prelabral setae barbed (Fig. 2D). Legs unscaled, trochanteral organ with 16 setae (Fig. 2E). Unguis with 1 pair of lateral teeth, 1 inner tooth (Fig. 2F). Unguiculus simple and smooth, reach 2/3 of unguis length, and untooth (Fig. 2F). Ventral tube unscaled, anterior side with 4 setae,

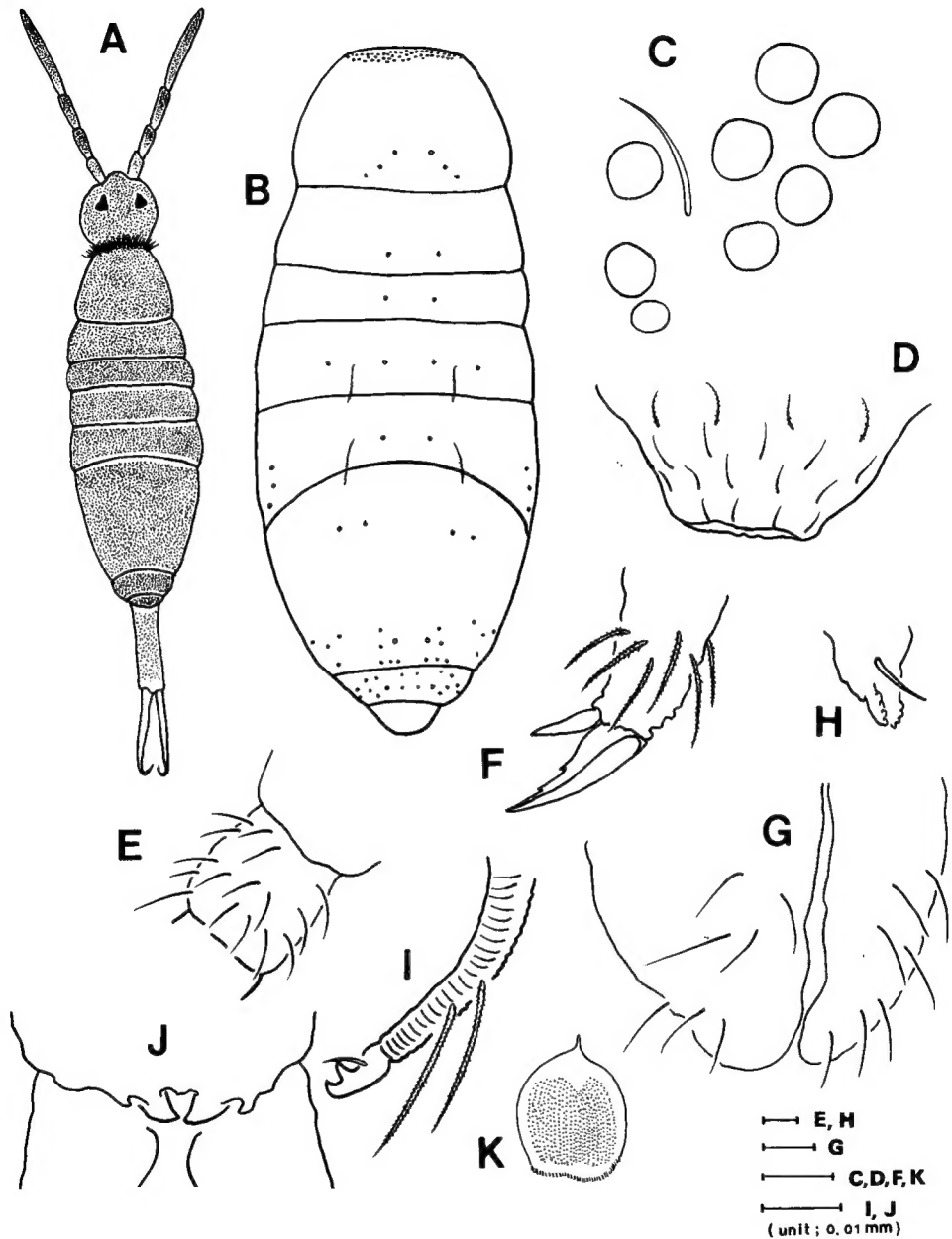


Fig. 2. *Lepidocyrtus koreanus* Kim and Lee, n. sp.: A, habitus; B, chaetotaxy of thoracic and abdominal tergites; C, ocelli; D, labrum; E, trochanteral organ; F, hindclaw; G, ventral tube; H, tenaculum; I, mucro and posterior part of dens; J, dental appendix; K, scale of tergite.

posterior side with 3 setae (Fig. 2G). Tenaculum quadridentated, with 1 median seta (Fig. 2H). Furca ratio as manubrium : dens : mucron = 23:23:1. Manubrium unscaled, with 4 ventral terminal setae. Dens with granules and crenulated on posterior side (Fig. 2I). With 1 dorsal appendix of dens (Fig. 2J). Mucro very short, with equally bidentated and 1 basal spine (Fig. 2I). Scales hyaline, rounded

(Fig. 2K).

Type data. Holotype. ♂ Chollanam-do Province, Chindo-gun County, Somang-ri, collected from a haycock beside road. Coll. no. 94-7-7, 25 July 1994. Paratypes. 8 ♂♂, 3 ♀♀, same data as holotype.

Remarks. This species is related to *L. cyaneus* Tullberg, 1871 from Europe and Japan, by sharing similar body color, manubrium : mucrodens ratio, mucron teeth and dens but is differentiated by the body size and antenna : head ratio.

This genus is a new record for Korea.

DISCUSSION

So far 27 species of Entomobryidae were known from Korea, of which the genus *Homidia* embodies 14 species, that is more than half. With the present study total number of Entomobryid Collembola from Korea reaches 29 species. The endemicity of the family is revealed to be as high as 87% even though it is too early to draw any general picture of the pattern with such meager extent of the inventory.

One thing worth of our special interest might be the unusual occurrence of *Lepidocyrtus* which has so far been limited to Europe and Japan in Asia, only from tropical areas up to Japanese Archipelagoes (Yosii, 1977, 1982). The new record from Korea, therefore, should be of special interest in the further studies as to how it might be varied from those of southern Asia and Europe and what would be the dispersion route along with concomitant evolutionary change.

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RECEIVED: 5 October 1995

ACCEPTED: 13 November 1995

珍島産 톡토기(곤충강)에 관한 分類學的 研究

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요 약

진도의 톡토기目に 대한 분류학적 연구를 실시한 결과 *Crossodonthina koreana* Yosii and Lee, 1963, *Homidia minuta* n. sp., *H. munda munda* Yosii, 1956, *H. mediaseta* Lee and Lee, 1981, *H. vigintiseta* Lee and Park, 1984 및 *Lepidocyrtus koreanus* n. sp. 등 2신종을 포함하여 모두 2과 3속 6종을 밝혔다. 이로써 한국산 털보톡토기과는 북한산을 포함하여 모두 5속 29종이 된다.